PHENIX MuTr STATION 2 SOUTH INSTALLATION PROCEDURE

procedure name

PHENIX Procedure No. PP-2.5.5.4-10

Revision: A **Date:** ~~4-28-00~~ 6-30-00 ABB

Hand Processed Changes

HPC No.	Date	Page Nos.	Initials

Approvals

7/10/00
PHENIX S E & I Date

Cognizant Scientist/Engineer Date
/Activity Manager

7/10/00
PHENIX /Safety Date

7/20/00
CA-D ES&H /SAFETY Date

REVISION CONTROL SHEET

LETTER	DESCRIPTION	DATE	WRITTEN BY	APPROVED BY	CURRENT OVERSIGHT
A	First Issue	6/30/2000	n/a	P. Kroon, W. Sondheim, W. Lenz, C. Pearson	n/a
RETIRED	Installation Completed	3/20/2007	n/a	D. Lynch, P. Giannotti, R. Pisani for PHENIX	D.Lynch

Station 2 South Installation Procedure PP-2.5.5.4-10

1.0 Purpose and Scope

1.1 The purpose of this procedure is to provide direction for the rigging of the station 2 south octants. This procedure provides detailed instructions for the safe installation of the octants to the "spider".
Note that the weight for each octant is 250 lbs.

2.0 Responsibilities

2.1 All operations shall be performed under the direction of the PHENIX experimental hall "person-in-charge", or their designee.

2.2 Due to the delicacy of this structure, and the critical alignment of its assembly in the magnet, this procedure and all relevant BNL safety guidelines must be strictly adhered to. In accordance with BNL policy, any individual may cease operations if they in any way feel unsafe or if they believe unsafe procedures are being followed, such a complaint shall be reviewed by the cognizant engineer, and if necessary, BNL ES&H Services.

2.3 A representative of the muon tracking mechanical team should be present for all lifts, to consult on procedures and answer any questions as they may arise.

3.0 Prerequisites

3.1 Training: All personnel involved in this procedure shall have reviewed this procedure, and be fully knowledgeable about the way in which the octant is mounted in the South magnet. A meeting will take place with all participants involved with this installation to review all aspects and answer any questions that any of the personnel may have.

3.2 All personnel involved in this procedure shall wear hardhats and safety shoes.

4.0 Precautions

4.1 The area where rigging operations will be performed shall be cordoned-off to all personnel except the "person in charge" and the technicians assigned to perform this procedure.

4.2 Some operations will require personnel to work in close proximity to suspended loads. Do not permit anyone to be positioned under the load.

4.3 Lift the octants with the commercial lifting fixture only and only with the protective covers in place on the octant.

5.0 Equipment List

5.1 Appropriate ANVER lifting fixture, model number LBT50-MROT-SP, serial number 001764, rated load capacity 500 pounds. All four steel 5/16-18 X 2" length bolts used to attach the ANVER lifter to the four tapped holes on the octant downstream frame, as located on dwg. Number 002-0212-325 sheet D1 (see G holes) should be tightened to 150 in-lbs. PHENIX dwg no. 002-0212-610

5.2 "C" fixture, rated load capacity 800 pounds.

5.3 Guide ropes.

5.4 Shackles, rated minimum load capacity 1000 pounds.
5.5 Stainless Steel hardware, including threaded rods.

6.0 Preparation

6.1 Support "spider" in place and surveyed.
6.2 Install the stainless steel threaded rods in place on the "spider" where indicated on PHENIX drawing no. 002-0212-260, sheets D1, D2 and D3, four locations on each spoke, 32 total.
6.3 Each octant mounts to the spider in 10 locations; the 4 C holes along each side of an octant and the two middle C holes along the outer edge. These are indicated on PHENIX drawing no. 002-0212-328 sheet D1 and 002-0212-326 sheet D1. See the mounting locations on spider drawings 002-0212-260 sheets d1-d3.
6.4 Install bottom platform and side stairs as shown on magnet scaffolding assembly drawing package, Ray Savino will supply prints and hardware.
6.5 In order for the rigging crew in 1008 to become familiar with both the ANVER lifter and the "C" fixture, a non critical full scale station 2 front octant is available to practice with in the magnet.
6.6 THERE IS ONLY 1 5/8-INCH CLEARANCE BETWEEN THE CATHODE CARD CONNECTORS AND THE MAGNET LAMPSHADE PANEL. This is why using the non-critical octant in 6.5 is important.
6.7 It is critical that the brake on the crane used is in working order, lifts of a fraction of an inch may be required – and the use of a chain fall, or similar device may be required to get the fine adjustment needed to locate these chambers in the magnet.
6.8 As an added precaution, to prevent damage to the cathode readout circuit cards, install two 5/16-18 bolts that are at least two inches longer then the height of the circuit cards from the top edge of the detector frame. Screw these bolts into two of the threaded holes on the top edge of the frame. These should be removed after the octant has been secured to the support spider.

7.0 Procedure

7.1 Front octants.(smaller octants)
- 7.1.1 The frame side with the machined surface cutout faces are downstream, see front octant rear frame drawing 002-0212-325 sheet D1. Installation proceeds from the bottom of the spider to the top at every other location beginning wit the 6:00 o'clock octant followed by the 3:00,9:00,12:00.
- 7.1.2 FIRST OCTANT ONLY _ 6:00 position
  - 7.1.2.1 Attach "C" fixture to the crane hook and attach the ANVER lifting fixture to the "C" fixture.
- 7.1.3 Attach the ANVER lifting fixture to the octant in the horizontal position following the manufacturer instructions and with the fixtures provided. Lift the octant and tilt the octant to a vertical position.
- 7.1.4 Rotate the octant to the desired orientation on the "spider".

7.1.5 Attach guide ropes to the octant as needed.

7.1.6 First Octant Only

7.1.6.1 Lift and lower the octant in place downstream of the spider, to allow possible rotation of the octant to get into position under the piston. Once the octant is directly under the piston move it upstream and attach to the "spider" at the outside boundary, us the threaded rods as guides on ecah side of the octant. Place temporary nuts and spacers on the side threaded rod. Use guide ropes to stabilize the octant. Torque the 3/8-16 stainless steel bolts and nuts to 236 in-lbs.

7.1.7 Remaining front octants

7.1.7.1 No "C" fixture needed. Install the 3:00 and 9:00 o'clock octants next followed by the 12:00 o'clock. Lift and lower the octant into place. Attach to the spider and place temporary nuts and spacers on the threaded rod on the sides of the octants.

7.1.8 Remove gas window aluminum plates on the upstream side of the octants.

7.1.9 Install alignment lenses, 4 per octant as shown on dwgs numbered 002-0212-332 sheets D1 and D2, 002-0212-234 sheet D1, 002-0212-235 sheet D2 and 002-0212-236 sheet D6. The lens blocks that mount along the outer edge will be installed later.

7.2 Rear Octants.

7.2.1 The frame side with the machined surface for the lens blocks faces downstream see dwg. Number 002-0212-327 sheet D1. Installation proceeds from the bottom of the spider to the top at every other location beginning at 4:30 o'clock and proceeding in order 4:30,7:30,1:30,10:30.

7.2.2 Attach the ANVER lifting fixture to the octant in the horizontal position following the manufacturer instructions. Lift the octant and tilt the octant to a vertical position.

7.2.3 Rotate the octant to the orientation in the "spider".

7.2.4 Attach guide ropes to the octant as needed.

7.2.5 Remove temporary nuts from sides of adjacent octants.

7.2.6 Attach 2 stabilizer brackets to the outside cross member on the spider, drawing number 002-0212-260 sheets D1 and 002-0212-261 sheet D1.

7.2.7 Remove protective aluminum cover on upstream side of octant.

7.2.8 Remove temporary nuts from threaded rods and aluminum spacer block, along spoke where octant will be attached.

7.2.9 Lift and lower the octant into place and attach to the stabilizer brackets at the outside boundary. Place nuts and washers on the side threaded rods and torque to 236 in-lbs.

7.2.10 Install alignment lenses, 4 per octant as shown on dwgs numbered 002-0212-332 sheets D1 and D2, 002-0212-234 sheets D1, 002-

0212-235 sheet D2 and 002-0212-236 sheet D6. The three lens blocks that mount along the outer edge will be attached later.

7.3 Remove downstream protective gas window covers from octants only after the following work has been completed; the FEE mechanical structure is in place, the lower scaffolding platform and side steps are in place, the bottom station 2 cross rib assembly is installed and connected to the chamber. It will be difficult to remove these covers later – so removal from the bottom up as the FEE cross ribs are installed is the current thinking.

8.0 Alignment

8.1 Alignment crew – surveys the octants from both the upstream and downstream sides, all bolts are checked for a torque of 236 in-lbs.

REVISIONS			
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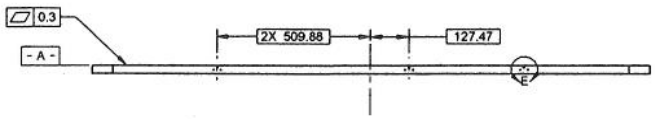
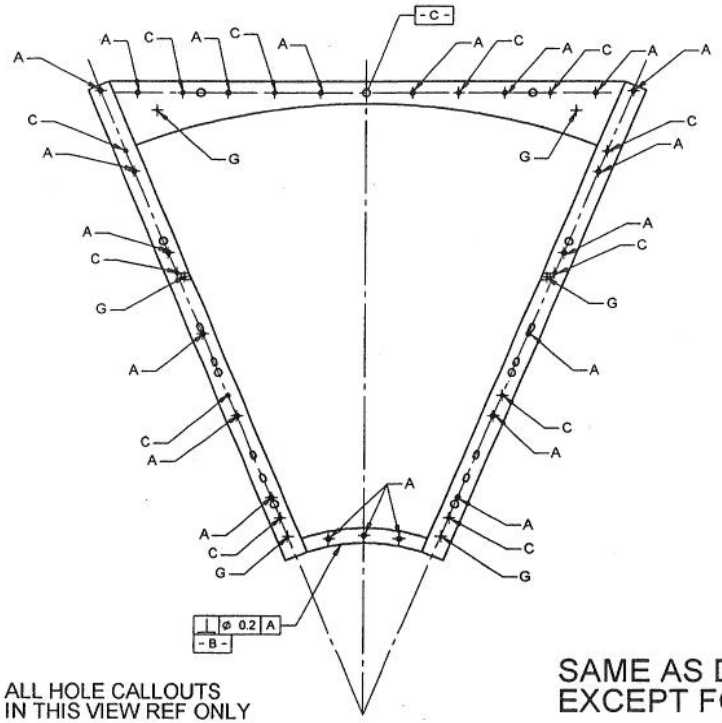
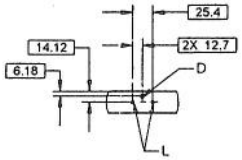
A	RELEASED PER ECN# 002-0212-328-A	7/16/98	T. THOMPSON

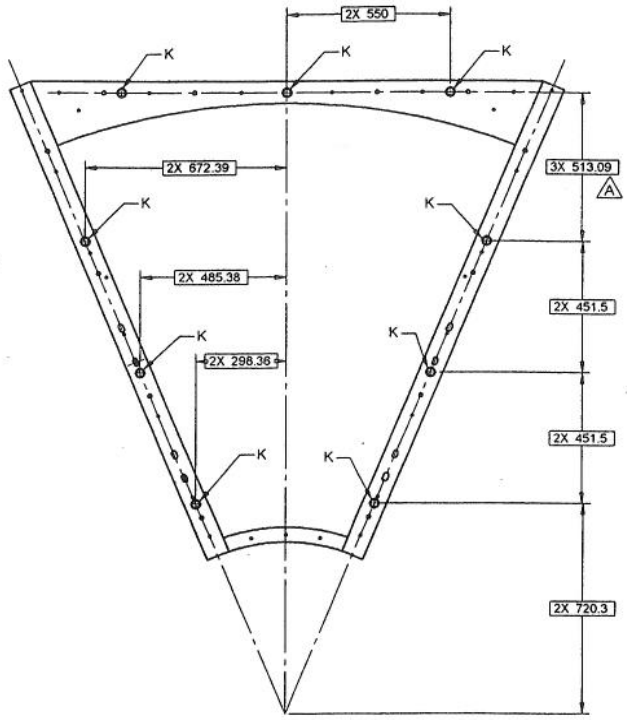


FAR SIDE VIEW





DETAIL E
SCALE 1 : 3
3 PATTERNS



6-30-98 W.S.

ALL HOLE CALLOUTS
IN THIS VIEW REF ONLY

SAME AS DRAWING# 002-0212-324
EXCEPT FOR AS SHOWN

SEP 0 6 1998

NOTES: UNLESS OTHER WISE SPECIFIED

1. ALL DIMENSIONS MILLIMETERS
2. DIMENSIONS AND TOLERANCING PER ANASI Y14.5M-1982
3. SURFACE TEXTURE PER ANI/ASME B 46.1-1985
4. REMOVE ALL BURRS AND BREAK SHARP EDGES TO A MAXIMUM OF .38
5. ALL INSIDE CORNERS TO BE .38 RADIUS MAX
6. COUNTERSINK 82 DEGREES ALL TAPPED HOLES TO MAJOR DIAMETER
7. COUNTERSINK 82 DEGREES APPROXIMATELY .76-1.52 DEEP ALL DRILLED HOLES
8. PARTS TO BE THOROUGHLY CLEANED TO REMOVE ALL OIL, GREASE, DIRT AND CHIPS
9. PART NUMBER (DRAWING NO. PLUS DASH NO. PLUS SERIAL NO.) TO BE CLEARLY MARKED ON THE PART ITSELF.

HOLE	NO. REQ'D	TAPPED/MACHINED HOLE	↧	⌴ Ø	↧	POSITIONAL TOLERANCING
D	3	.190(#10) - 32 UNF-2B	12.70	–	–	⌖ Ø 0.3Ⓜ A BⓂ CⓂ
K	9	Ø 25.425 / 25.400 (USE Ø 1.001 IN. REAM)	THRU	31.75 FROM FAR SIDE	7.14	⌖ Ø 0.03Ⓜ A BⓂ CⓂ
L	6	PRESS FIT FOR Ø .125 IN STANDARD DOWEL PIN	15.09	–	–	⌖ Ø 0.3Ⓜ A BⓂ CⓂ

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE MILLIMETERS -TOLERANCES- DECIMALS X. ± .25, .X ± .25, .XX ± .25; ANGULAR ± .25°; SURFACE FINISH = 3.2

CAD GENERATED DRAWING, DO NOT MANUALLY UPDATE DO NOT SCALE DRAWING

FINISH

PART NO. 002-0212-328-1

	SIGNATURE	DATE
DESIGNED	E. ROMERO	5-29-98
DRAWN	E. ROMERO	5-29-98
CHECKED	H. SALAZAR	5-29-98
ENGR	T. THOMPSON	5-29-98
APPROVED	T. THOMPSON	5-29-98

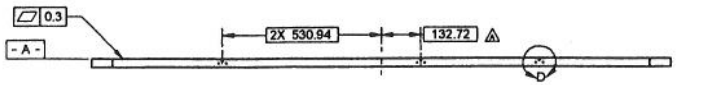
SCALE 1/8

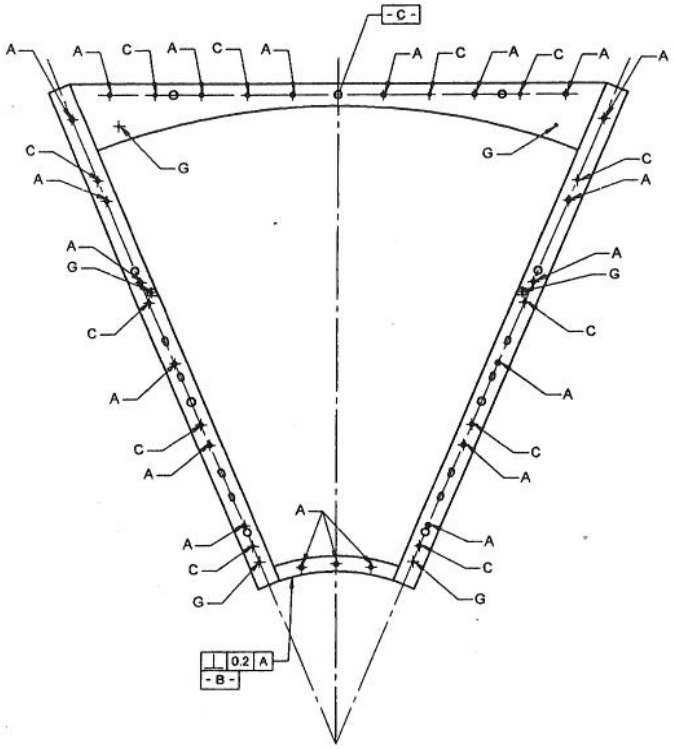
HYTEC, INC

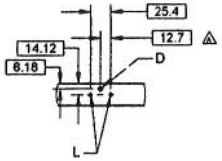
TITLE: PHENIX STATION 2 SOUTH FRONT CHAMBER FRONT FRAME

DWG. NO 002-0212-328 SIZE D SHEET NO 1 of 1

REVISION A

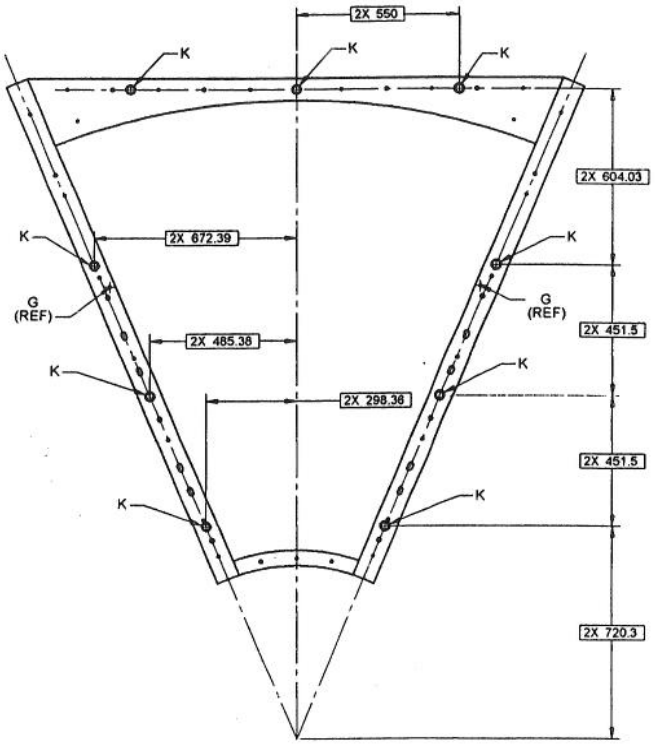






DETAIL D
SCALE 1 : 3
3 PATTERNS

FAR SIDE VIEW



ALL HOLE CALLOUTS
IN THIS VIEW REF ONLY

SAME AS DRAWING# 002-0212-322
EXCEPT FOR AS SHOWN

8/2/99 W.S.

AUG 0 3 1999

NOTES: UNLESS OTHER WISE SPECIFIED

1. ALL DIMENSIONS MILLIMETERS
2. DIMENSIONS AND TOLERANCING PER ANASI Y14.5M-1982
3. SURFACE TEXTURE PER ANI/ASME B 46.1-1985
4. REMOVE ALL BURRS AND BREAK SHARP EDGES TO A MAXIMUM OF .38
5. ALL INSIDE CORNERS TO BE .38 RADIUS MAX
6. COUNTERSINK 82 DEGREES ALL TAPPED HOLES TO MAJOR DIAMETER
7. COUNTERSINK 82 DEGREES APPROXIMATELY .76-1.52 DEEP ALL DRILLED HOLES
8. PARTS TO BE THOROUGHLY CLEANED TO REMOVE ALL OIL, GREASE, DIRT AND CHIPS
9. PART NUMBER (DRAWING NO. PLUS DASH NO. PLUS SERIAL NO.) TO BE CLEARLY MARKED ON THE PART ITSELF.

HOLE	NO. REQ'D	TAPPED/MACHINED HOLE	↧	⌴ ⌀	↧	POSITIONAL TOLERANCING
D	3	.190 (#10) - 32 UNC-2B	12.7	–	–	⌖ ⌀ 0.3Ⓜ A BⓂ CⓂ
K	9	Ø 25.425 / 25.4 (USE 1.001 IN. REAM)	THRU	31.75 FROM FAR SIDE	7.14	⌖ ⌀ 0.03Ⓜ A BⓂ CⓂ
L	6	PRESS FIT FOR Ø.125 IN. STD. DOWEL PIN	THRU	⚠ –	–	⌖ ⌀ 0.3Ⓜ A BⓂ CⓂ

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE MILLIMETERS -TOLERANCES- DECIMALS .X ± .25 .XX ± .25 ANGULAR ± .25° SURFACE FINISH 3.2

FINISH

PART NO. 002-0212-326-1

CAD GENERATED DRAWING. DO NOT MANUALLY UPDATE DO NOT SCALE DRAWING

DRAWN	E. ROMERO	5-29-98
CHECKED	S. RUMBAU	5-29-98
ENG APPR.	H. SALAZAR	5-29-98
MFG APPR.	T. THOMPSON	5-29-98
Q.A.	T. THOMPSON	5-29-98

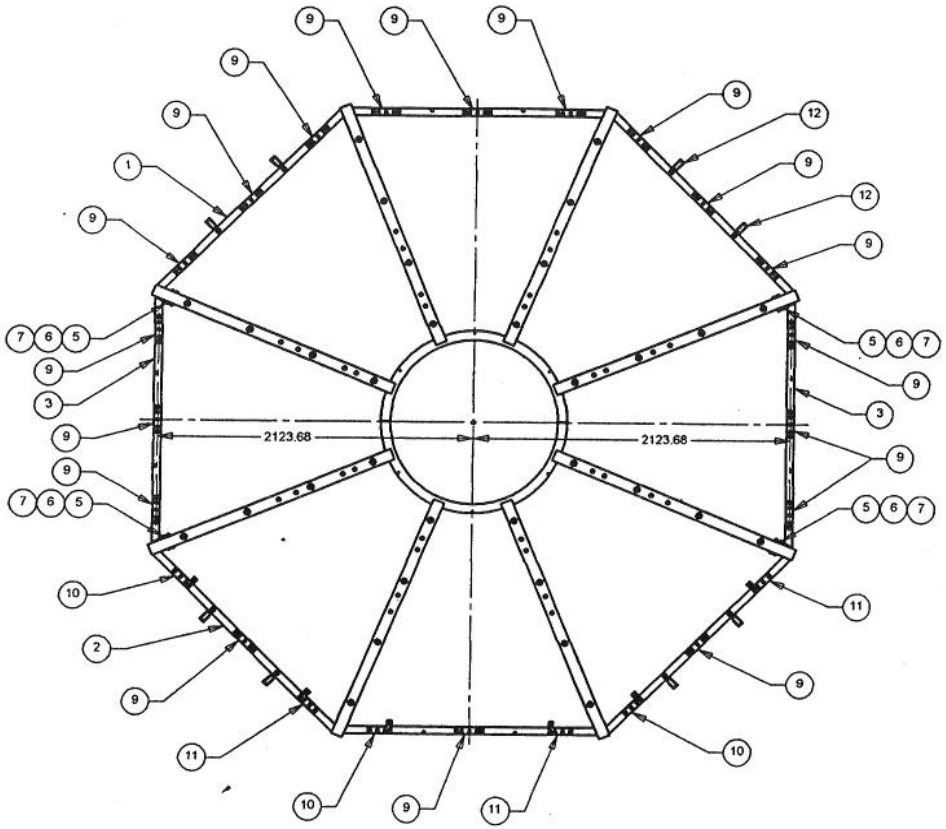
HYTEC, INC

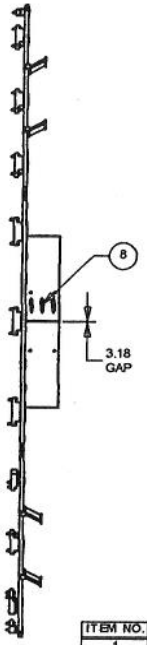
PHENIX STATION 2 SOUTH
REAR CHAMBER
FRONT FRAME

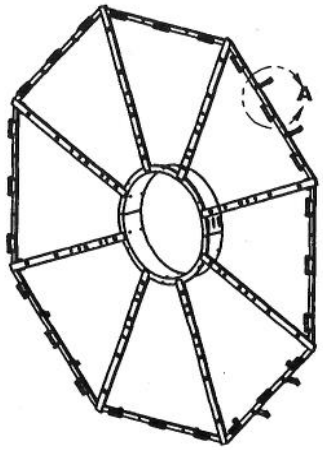
002-0212-326 D 1 of 1

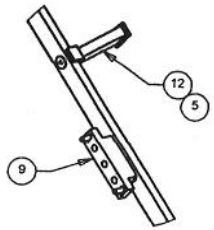
1/8" A

REV	DESCRIPTION	REVISED	DATE	APPROVED









DETAIL A
SCALE 1 : 6

ITEM NO.	QTY.	PART NO.	DESCRIPTION	MATERIAL
1	1	002-0212-260-D2	Top Frame Sub-Assembly	
2	1	002-0212-260-D3	Bottom Frame Sub-Assembly	
3	2	002-0212-260-D6	Splice Tube Weldment	
4	8		Soc Hd Screw, 3/8-16 UNC-2A X 1.25 lg.	SST
5	14		Soc Hd Screw, 3/8-16 UNC-2A X 3.75 lg.	SST
6	16		Flat Washer, 3/8	SST
7	8		Hex Nut, 3/16 UNC-2B	SST
8	8	002-0212-261-D1	Inner Detector Stabilizer	
9	18	002-0212-262-D1	Support Bracket Assembly	
10	3	002-0212-264-D1	Right Support Bracket Assembly	
11	3	002-0212-263-D1	Left Support Bracket Assembly	

PARTS LIST

NOTES: UNLESS OTHER WISE SPECIFIED

1. ALL DIMENSIONS IN MILLIMETERS
2. DIMENSIONS AND TOLERANCING PER ANASI Y14.5M-1994
3. SURFACE TEXTURE PER ANI/ASME B 46.1-1985
4. REMOVE ALL BURRS AND BREAK SHARP EDGES TO A MAXIMUM OF .015
5. ALL INSIDE CORNERS TO BE .015 RADIUS MAX
6. COUNTERSINK 82 DEGREES ALL TAPPED HOLES TO MAJOR DIAMETER
7. COUNTERSINK 82 DEGREES APPROXIMATELY .03/.06 DEEP ALL DRILLED HOLES
8. PARTS TO BE THOROUGHLY CLEANED TO REMOVE ALL OIL, GREASE, DIRT AND CHIPS
9. PART NUMBER (DRAWING NO., DASH NO., REVISION NO., SERIAL NO.) TO BE CLEARLY MARKED ON THE PART ITSELF.

OCT 13 1999

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE MILLIMETERS -TOLERANCES- DECIMALS .X ± xx .25, .X ± xx .20, .XX ± xx .25 ANGULAR ± xx .25° SURFACE FINISH = 3.2

FINISH

CAD GENERATED DRAWING. DO NOT MANUALLY UPDATE DO NOT SCALE DRAWING

	SIGNATURE	DATE
DESIGNED	Roger L. Smith	8-26-99
DRAWN	Roger L. Smith	8-26-99
CHECKED	Walt Sondheim	10-09-99
ENGR	Walt Sondheim	10-09-99
APPROVED	Walt Sondheim	10-09-99

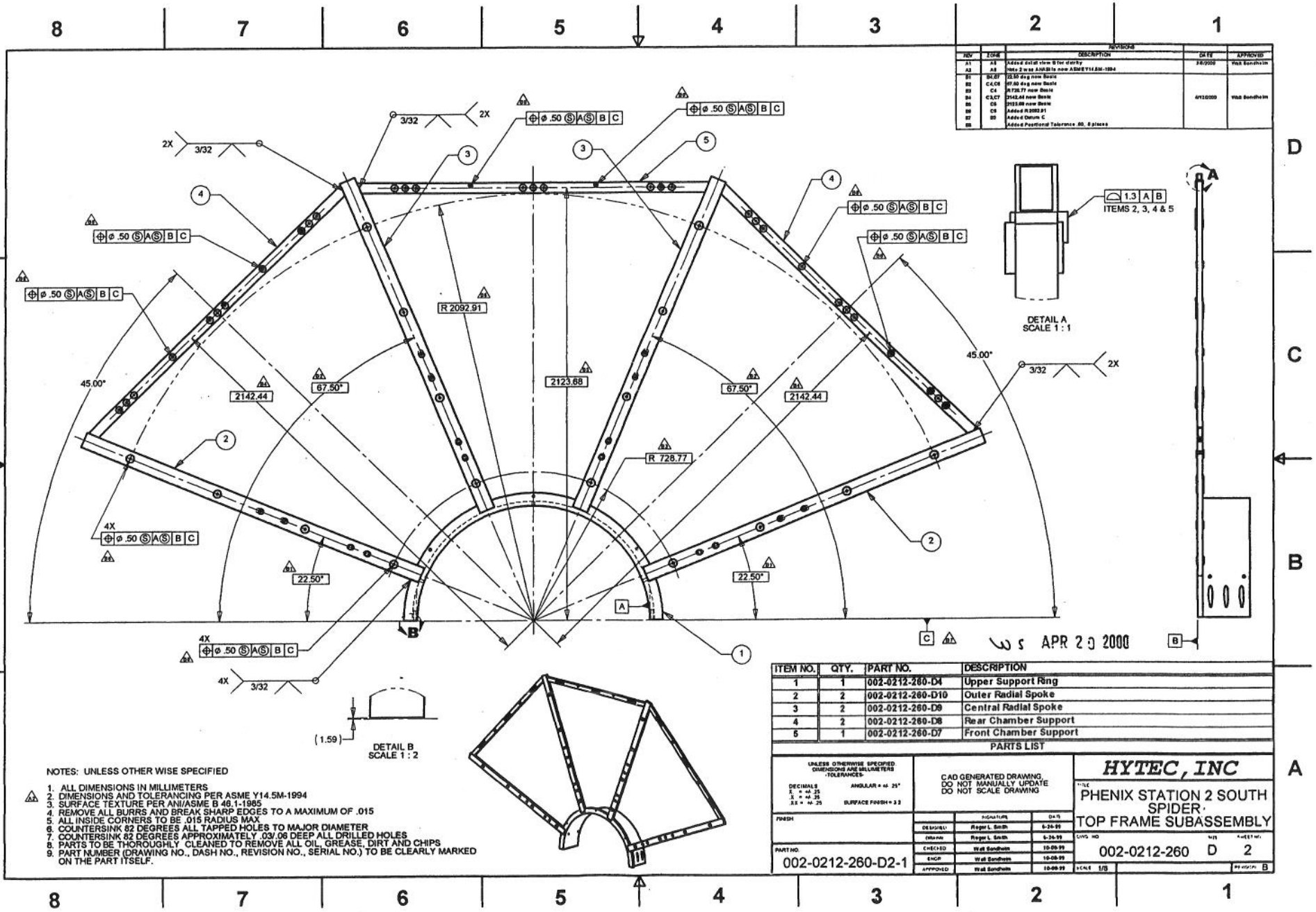
PART NO. 002-0212260-D1-1

HYTEC, INC

TITLE: PHENIX STATION 2 SOUTH SPIDER SUPPORT RING ASSEMBLY

DWG NO. 002-0212-260 SIZE D SHEET NO 1

SCALE 1/16 REVISION



REV	ZONE	DESCRIPTION	DATE	APPROVED
A1	A8	Added detail view B for clarity	3/6/2000	Walt Sandheim
A2	A8	Note 2 was ANSI B is now ASME Y14.5M-1994		
B1	B4,B7	22.50 deg now Basic		
B2	C4,C6	67.50 deg now Basic		
B3	C4	R728.77 now Basic		
B4	C3,C7	2142.44 now Basic	4/12/2000	Walt Sandheim
B5	C5	2123.68 now Basic		
B6	C9	Added R2092.91		
B7	B5	Added Datum C		
B8		Added Positional Tolerance .50, 8 places		

ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	002-0212-260-D4	Upper Support Ring
2	2	002-0212-260-D10	Outer Radial Spoke
3	2	002-0212-260-D9	Central Radial Spoke
4	2	002-0212-260-D8	Rear Chamber Support
5	1	002-0212-260-D7	Front Chamber Support

PARTS LIST

NOTES: UNLESS OTHER WISE SPECIFIED

1. ALL DIMENSIONS IN MILLIMETERS
2. DIMENSIONS AND TOLERANCING PER ASME Y14.5M-1994
3. SURFACE TEXTURE PER ANI/ASME B 46.1-1985
4. REMOVE ALL BURRS AND BREAK SHARP EDGES TO A MAXIMUM OF .015
5. ALL INSIDE CORNERS TO BE .015 RADIUS MAX
6. COUNTERSINK 82 DEGREES ALL TAPPED HOLES TO MAJOR DIAMETER
7. COUNTERSINK 82 DEGREES APPROXIMATELY .03/.06 DEEP ALL DRILLED HOLES
8. PARTS TO BE THOROUGHLY CLEANED TO REMOVE ALL OIL, GREASE, DIRT AND CHIPS
9. PART NUMBER (DRAWING NO., DASH NO., REVISION NO., SERIAL NO.) TO BE CLEARLY MARKED ON THE PART ITSELF.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE MILLIMETERS TOLERANCES: DECIMALS X = +/- .25, .X = +/- .25, .XX = +/- .25; ANGULAR = +/- 25°; SURFACE FINISH = 3.2

CAD GENERATED DRAWING. DO NOT MANUALLY UPDATE DO NOT SCALE DRAWING

FINISH

PART NO. 002-0212-260-D2-1

	SIGNATURE	DATE
DESIGNED	Roger L. Smith	6-26-99
DRAWN	Roger L. Smith	6-26-99
CHECKED	Walt Sandheim	10-08-99
ENGR	Walt Sandheim	10-08-99
APPROVED	Walt Sandheim	10-08-99

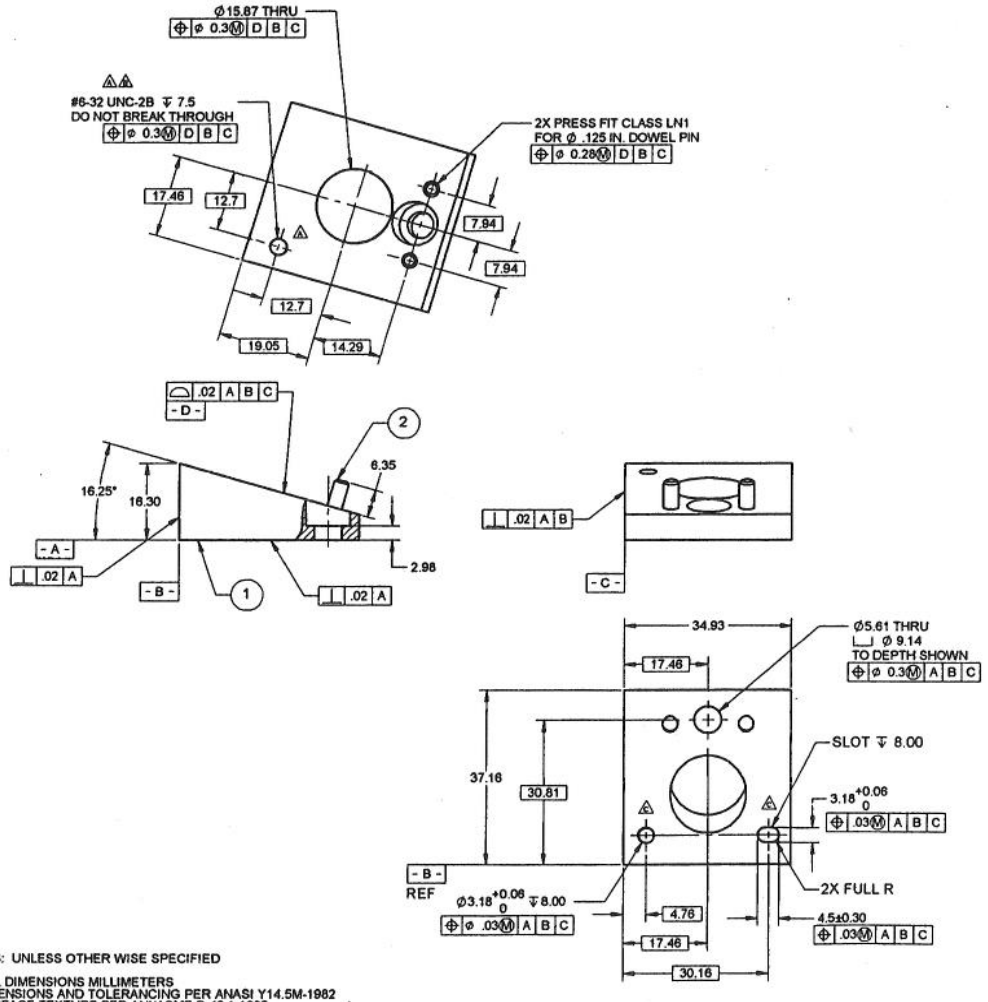
HYTEC, INC

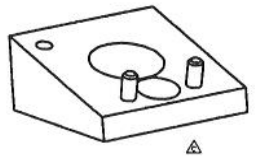
TITLE: PHENIX STATION 2 SOUTH SPIDER TOP FRAME SUBASSEMBLY

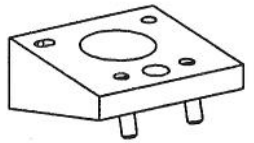
DWG NO. 002-0212-260 | SIZE D | SHEET NO. 2 | REV B

SCALE 1/8

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	SEE ECN #002-0212-332-A	10/15/99	T. THOMPSON
B	SEE ECN #002-0212-332-B	12/15/99	T. THOMPSON
C	SEE ECN #002-0212-332-C	7/28/99	T. THOMPSON







8/2/99 W. S.

NOTES: UNLESS OTHER WISE SPECIFIED

1. ALL DIMENSIONS MILLIMETERS
2. DIMENSIONS AND TOLERANCING PER ANASI Y14.5M-1982
3. SURFACE TEXTURE PER ANI/ASME B 46.1-1985
4. REMOVE ALL BURRS AND BREAK SHARP EDGES TO A MAXIMUM OF .38
5. ALL INSIDE CORNERS TO BE .38 RADIUS MAX
6. COUNTERSINK 82-90 DEGREES ALL TAPPED HOLES TO MAJOR DIAMETER
7. COUNTERSINK 82-90 DEGREES APPROXIMATELY .76-1.52 DEEP ALL DRILLED HOLES
8. PARTS TO BE THOROUGHLY CLEANED TO REMOVE ALL OIL, GREASE, DIRT AND CHIPS
9. PART NUMBER (DRAWING NO. PLUS DASH NO. PLUS SERIAL NO.) TO BE CLEARLY MARKED ON THE PART ITSELF.

W. S. AUG 0 3 1999

ITEM	QUANTITY	DESCRIPTION	MATERIAL
1	1	STOCK	ALUMINUM 6061-T6
2	⚠ 2	.125 IN. STD. DOWEL, LENGTH= 1/2 IN. McMASTER-CARR# 98381A471	ALLOY STEEL

PARTS LIST

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE METRIC -TOLERANCES- DECIMALS .X ± ±0.2M .XX ± ±0.25 ANGULAR = ±0.25° SURFACE FINISH = 3.2

CAD GENERATED DRAWING. DO NOT MANUALLY UPDATE DO NOT SCALE DRAWING

FINISH

	SIGNATURE	DATE
DESIGNED	E. ROMERO	7-7-99
DRAWN	E. ROMERO	7-7-99
CHECKED	H. SALAZAR	7-7-99
ENGR	T. THOMPSON	7-7-99
APPROVED	T. THOMPSON	7-7-99

PART NO. 002-0212-332-D1-1

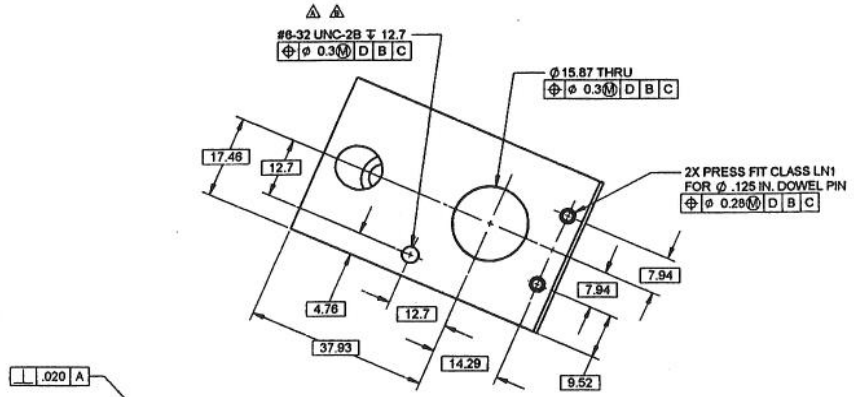
HYTEC, INC

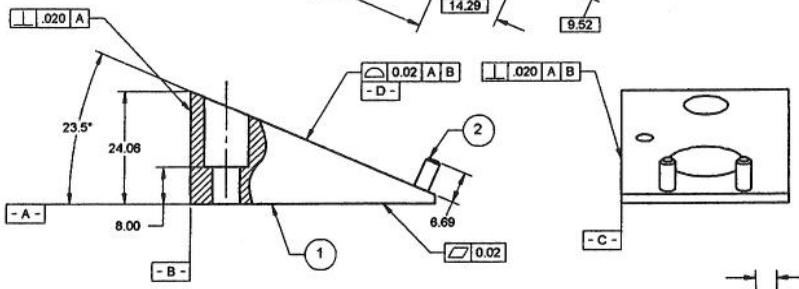
TITLE: STATION 2 SOUTH LENS HOLDER MOUNTING BLOCK F-C-L-B F-C-R-B

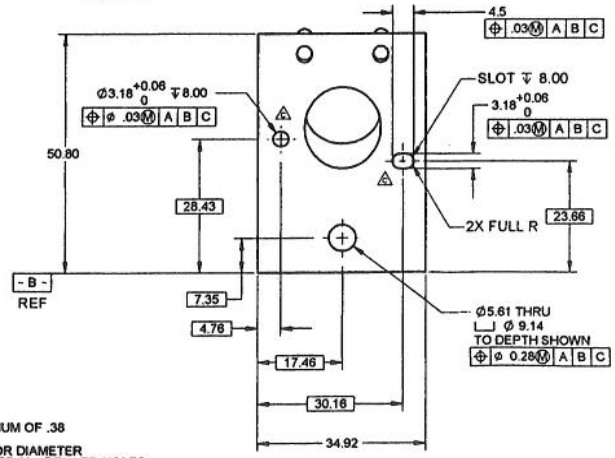
DWG NO. 002-0212-332 REV D SHEET 1 of 2

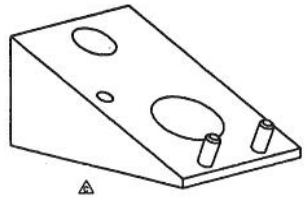
SCALE 2/1 WEIGHT C

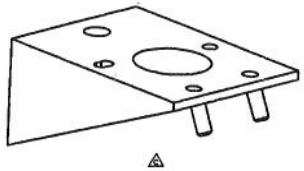
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	SEE ECN #002-0212-332-03-A	10-15-98	T. THOMPSON
B	SEE ECN #002-0212-332-03-B	12-15-98	T. THOMPSON
C	SEE ECN #002-0212-332-03-C	7-7-99	T. THOMPSON











8/2/99 W. S.

AUG 0 3 1999

NOTES: UNLESS OTHER WISE SPECIFIED

1. ALL DIMENSIONS MILLIMETERS
2. DIMENSIONS AND TOLERANCING PER ANASI Y14.5M-1982
3. SURFACE TEXTURE PER ANI/ASME B 46.1-1985
4. REMOVE ALL BURRS AND BREAK SHARP EDGES TO A MAXIMUM OF .38
5. ALL INSIDE CORNERS TO BE .38 RADIUS MAX
6. COUNTERSINK 82-90 DEGREES ALL TAPPED HOLES TO MAJOR DIAMETER
7. COUNTERSINK 82-90 DEGREES APPROXIMATELY .76-1.52 DEEP ALL DRILLED HOLES
8. PARTS TO BE THOROUGHLY CLEANED TO REMOVE ALL OIL, GREASE, DIRT AND CHIPS
9. PART NUMBER (DRAWING NO. PLUS DASH NO. PLUS SERIAL NO.) TO BE CLEARLY MARKED ON THE PART ITSELF.

ITEM	QUANTITY	DESCRIPTION	MATERIAL
1	1	STOCK	ALUMINUM 6061-T6
2	2	.125 IN. STD. DOWEL, LENGTH= 3/8 IN McMASTER-CARR# 98381A470	ALLOY STEEL

PARTS LIST

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE METRIC -TOLERANCES- DECIMALS .X = ±0.254 .XX = ±0.25 ANGULAR = ±0.25° SURFACE FINISH = 3.2

CAD GENERATED DRAWING, DO NOT MANUALLY UPDATE DO NOT SCALE DRAWING

FINISH

	SIGNATURE	DATE
DESIGNED	E. ROMERO	7-7-99
DRAWN	E. ROMERO	7-7-99
CHECKED	H. SALAZAR	7-7-99
ENGR	T. THOMPSON	7-7-99
APPROVED	T. THOMPSON	7-7-99

PART NO. 002-0212-332-D2-1

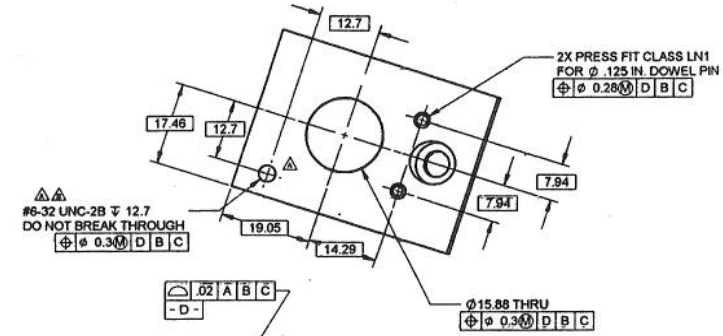
HYTEC, INC

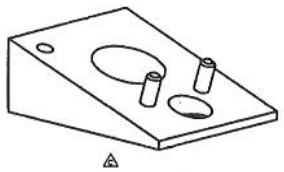
TITLE: STATION 2 SOUTH LENS HOLDER MOUNTING BLOCK F-C-L-M F-C-R-M

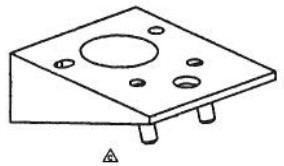
DWG NO. 002-0212-332 REV D SHEET 2 of 2

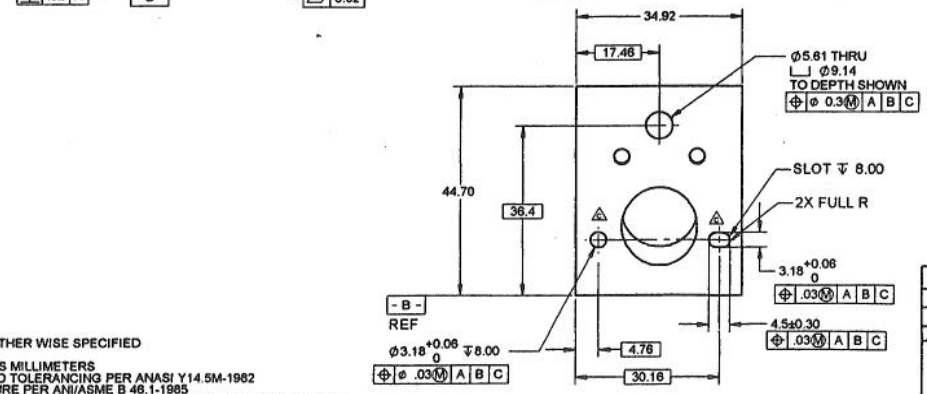
SCALE: 2/1 SIZE C

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	SEE ECN #002-0212-333-D1-A	10/13/98	T. THOMPSON
B	SEE ECN #002-0212-333-D1-B	12/15/98	T. THOMPSON
C	SEE ECN #002-0212-333-D1-C	7/7/99	T. THOMPSON









NOTES: UNLESS OTHER WISE SPECIFIED

1. ALL DIMENSIONS MILLIMETERS
2. DIMENSIONS AND TOLERANCING PER ANASI Y14.5M-1982
3. SURFACE TEXTURE PER ANI/ASME B 46.1-1985
4. REMOVE ALL BURRS AND BREAK SHARP EDGES TO A MAXIMUM OF .38
5. ALL INSIDE CORNERS TO BE .38 RADIUS MAX
6. COUNTERSINK 82-90 DEGREES ALL TAPPED HOLES TO MAJOR DIAMETER
7. COUNTERSINK 82-90 DEGREES APPROXIMATELY .76-1.52 DEEP ALL DRILLED HOLES
8. PARTS TO BE THOROUGHLY CLEANED TO REMOVE ALL OIL, GREASE, DIRT AND CHIPS
9. PART NUMBER (DRAWING NO. PLUS DASH NO. PLUS SERIAL NO.) TO BE CLEARLY MARKED ON THE PART ITSELF.

8/2/99 W. S.

W. S. AUG 0 3 1999

ITEM	QUANTITY	DESCRIPTION	MATERIAL
1	1	STOCK	ALUMINUM 6061-T6
2	⚠ 2	.125 IN. STD. DOWEL, LENGTH= 1/2 IN. McMASTER-CARR# 98381A471	ALLOY STEEL

PARTS LIST

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE METRIC -TOLERANCES- DECIMALS X = ±0.25, XX = ±0.25, ANGULAR = ±0.25° SURFACE FINISH = 3.2

CAD GENERATED DRAWING. DO NOT MANUALLY UPDATE DO NOT SCALE DRAWING

FINISH

	SIGNATURE	DATE
DESIGNED	E. ROMERO	7-7-99
DRAWN	E. ROMERO	7-7-99
CHECKED	H. SALAZAR	7-7-99
ENGR	T. THOMPSON	7-7-99
APPROVED	T. THOMPSON	7-7-99

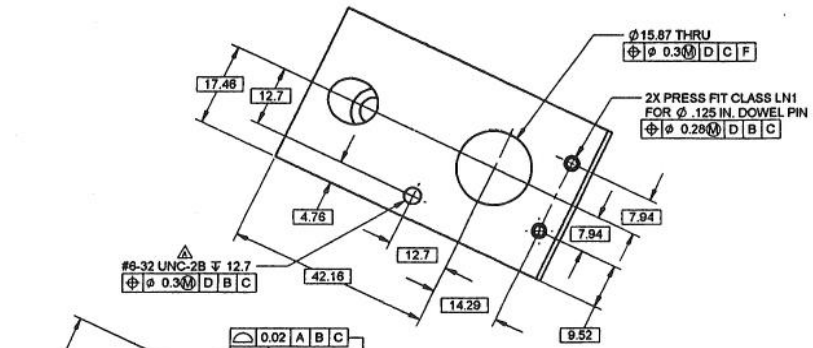
PART NO. 002-0212-333-D1-1

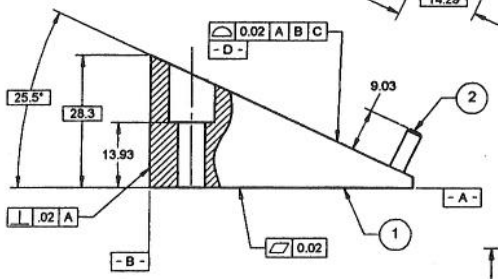
HYTEC, INC

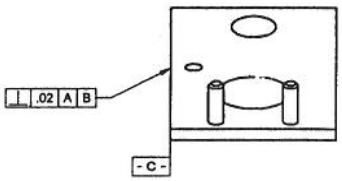
STATION 2 SOUTH
LENS HOLDER MOUNTING BLOCK
R-C-L-B
R-C-R-B

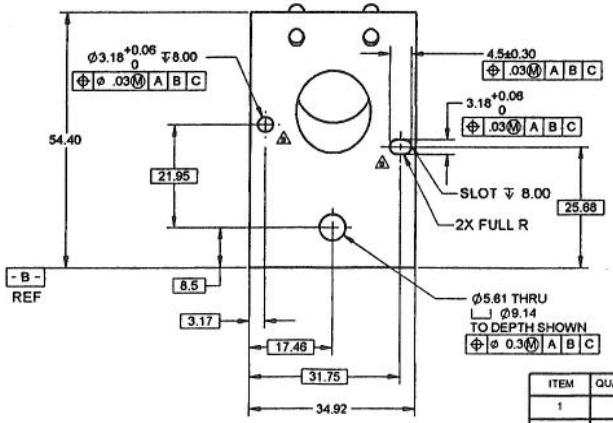
002-0212-333 D 1 of 2

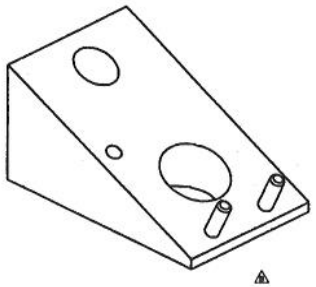
SCALE 2/1 C

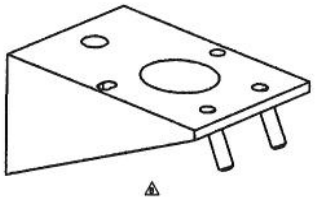












REV	DESCRIPTION	DATE	APPROVED
A	SEE ECN #982-0212-333-D2-A	10/15/98	T. THOMPSON
B	SEE ECN #982-0212-333-D2-B	7/8/99	T. THOMPSON

8/2/99 W. S.

AUG 0 3 1999

ITEM	QUANTITY	DESCRIPTION	MATERIAL
1	1	STOCK	ALUMINUM 6061-T6
2	2 ⚠	.125 IN. STD. DOWEL, LENGTH= 1/2 IN. McMASTER-CARR# 98381A471	ALLOY STEEL

PARTS LIST

NOTES: UNLESS OTHER WISE SPECIFIED

1. ALL DIMENSIONS IN MILLIMETERS
2. DIMENSIONS AND TOLERANCING PER ANASI Y14.5M-1982
3. SURFACE TEXTURE PER ANI/ASME B 46.1-1985
4. REMOVE ALL BURRS AND BREAK SHARP EDGES TO A MAXIMUM OF .38
5. ALL INSIDE CORNERS TO BE .38 RADIUS MAX.
6. COUNTERSINK 82-90 DEGREES ALL TAPPED HOLES TO MAJOR DIAMETER
7. COUNTERSINK 82-90 DEGREES APPROXIMATELY .76-1.52 DEEP ALL DRILLED HOLES
8. PARTS TO BE THOROUGHLY CLEANED TO REMOVE ALL OIL, GREASE, DIRT AND CHIPS
9. PART NUMBER (DRAWING NO. PLUS DASH NO. PLUS SERIAL NO.) TO BE CLEARLY MARKED ON THE PART ITSELF.

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE METRIC -TOLERANCES- DECIMALS .X ± ±0.25 .XX ± ±0.25 ANGULAR ± ±0.25° SURFACE FINISH = 3.2

CAD GENERATED DRAWING. DO NOT MANUALLY UPDATE DO NOT SCALE DRAWING

FINISH

PART NO. 002-0212-333-D2-1

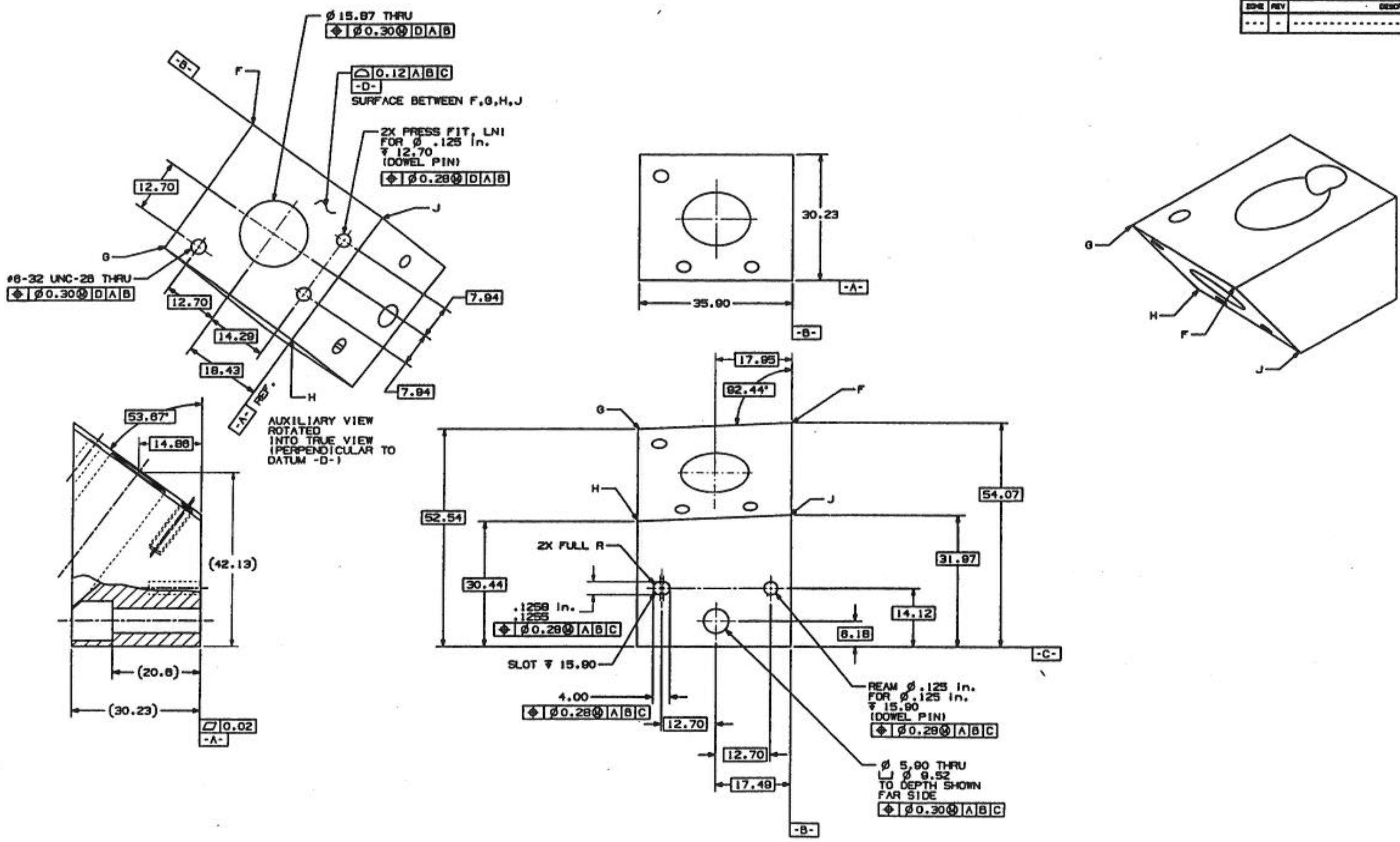
	SIGNATURE	DATE
DESIGNED	E. ROMERO	7-7-99
DRAWN	E. ROMERO	7-7-99
CHECKED	H. SALAZAR	7-7-99
ENGR	T. THOMPSON	7-7-99
APPROVED	T. THOMPSON	7-7-99

HYTEC, INC

STATION 2 SOUTH
LENS HOLDER MOUNTING BLOCK
R-C-L-M
R-C-R-M

DWG NO. 002-0212-333 SIZE D SHEET 2 of 2

SCALE 2/1 REV B



Ø 15.87 THRU
Ø 0.30 Ⓜ D A B
0.12 A B C
-D-
SURFACE BETWEEN F,G,H,J
2X PRESS FIT, LN1 FOR Ø .125 in. ↧ 12.70 (DOWEL PIN)
Ø 0.28 Ⓜ D A B
#6-32 UNC-2B THRU
Ø 0.30 Ⓜ D A B
12.70
12.70
14.29
18.43
7.94
7.94
-A- REF.
AUXILIARY VIEW ROTATED INTO TRUE VIEW (PERPENDICULAR TO DATUM -D-)
53.67°
14.86
(42.13)
(20.6)
(30.23)
0.02
-A-
30.23
35.90
-B-
17.95
92.44°
52.54
54.07
30.44
31.97
2X FULL R
.1258 in. .1255
Ø 0.28 Ⓜ A B C
SLOT ↧ 15.90
14.12
6.18
-C-
4.00
Ø 0.28 Ⓜ A B C
12.70
12.70
17.48
REAM Ø .125 in. FOR Ø .125 in. ↧ 15.90 (DOWEL PIN)
Ø 0.28 Ⓜ A B C
Ø 5.90 THRU ⌴ Ø 9.52 TO DEPTH SHOWN FAR SIDE
Ø 0.30 Ⓜ A B C
-B-

NOTES:

1. DIMENSIONS & TOLERANCING PER ANSI Y14.5M-1982.
2. SURFACE TEXTURE PER ANSI/ASME B 46.1-1985.
3. REMOVE ALL BURRS AND BREAK SHARP EDGES TO A MAXIMUM OF 0.38
4. PARTS TO BE THOROUGHLY CLEANED TO REMOVE ALL OIL, GREASE, DIRT AND CHIPS.
5. ALL INSIDE CORNERS TO BE 0.38 RADIUS MAX.

W.S. MAY 0 5 1999

W.S. JAN 0 8 2000

METRIC

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ZONE	ITEM NO
16	--------	----------------	ALUMINUM, 6061-T6		--

PARTS LIST/BILL OF MATERIAL

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS -TOLERANCES-
DECIMALS .X= ±2.54 .XX= ±0.25 .XXX= ±0.025 ANGULAR= ±.25° SURFACE FINISH= 3.2

BROOKHAVEN/PHENIX
DWG NO. 002-0212-234
DWG NO. 002-0212-334

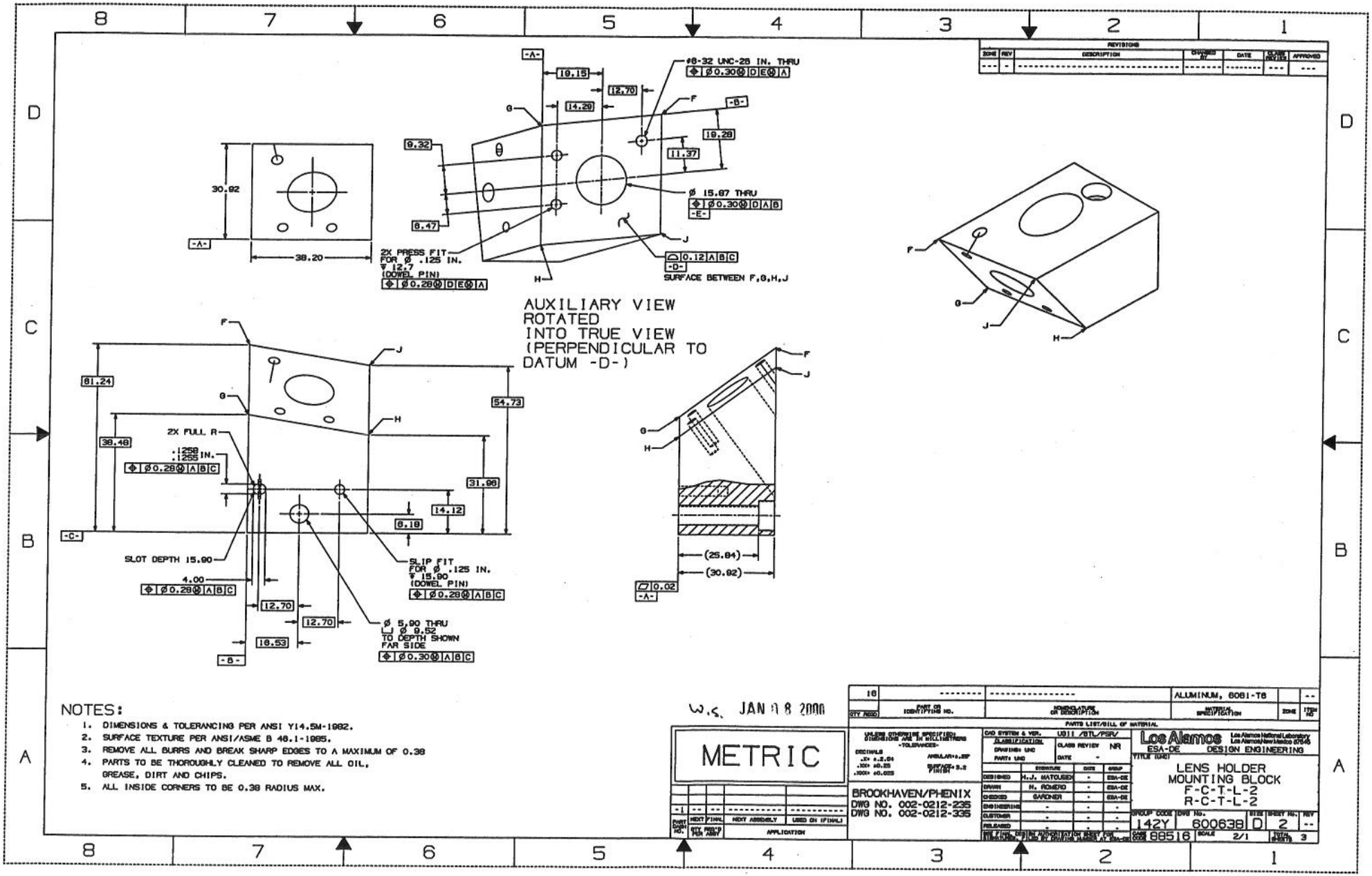
CAD SYSTEM & VER. U911 /STL/PSR/
CLASSIFICATION: DRAWING: UNC, PARTS: UNC; CLASS REVIEW: NR

	SIGNATURE	DATE	GROUP
DESIGNED	H.J. MATOUSEK	-	ESA-DE
DRAWN	N. ROMERO	-	ESA-DE
CHECKED	GARDNER	-	ESA-DE
ENGINEERING	-	-	-
CUSTOMER	-	-	-
RELEASED	-	-	-

Los Alamos — Los Alamos National Laboratory, Los Alamos New Mexico 87545
ESA-DE DESIGN ENGINEERING

TITLE (UNC)
LENS HOLDER
MOUNTING BLOCK
F-C-T-C-2
R-C-T-C-2

GROUP CODE 142Y | DWG No. 600638 | SIZE D | SHEET NO. 1 | REV --
CAGE CODE 88516 | SCALE 2/1 | TOTAL SHEETS 3



NOTES:

1. DIMENSIONS & TOLERANCING PER ANSI Y14.5M-1982.
2. SURFACE TEXTURE PER ANSI/ASME B 46.1-1985.
3. REMOVE ALL BURRS AND BREAK SHARP EDGES TO A MAXIMUM OF 0.38
4. PARTS TO BE THOROUGHLY CLEANED TO REMOVE ALL OIL, GREASE, DIRT AND CHIPS.
5. ALL INSIDE CORNERS TO BE 0.38 RADIUS MAX.

W.S. JAN 18 2000

METRIC

BROOKHAVEN/PHENIX
DWG NO. 002-0212-235
DWG NO. 002-0212-335

QTY	PART OR IDENTIFYING NO.	DESCRIPTION OR DESCRIPTION	MATERIAL SPECIFICATION
16	---	---	ALUMINUM, 6061-T6

PARTS LIST/BILL OF MATERIAL

REVISIONS					
ZONE	REV	DESCRIPTION	DRAWN BY	DATE	CLASS REVIEW	APPROVED
---	-	---	---	---	---	---

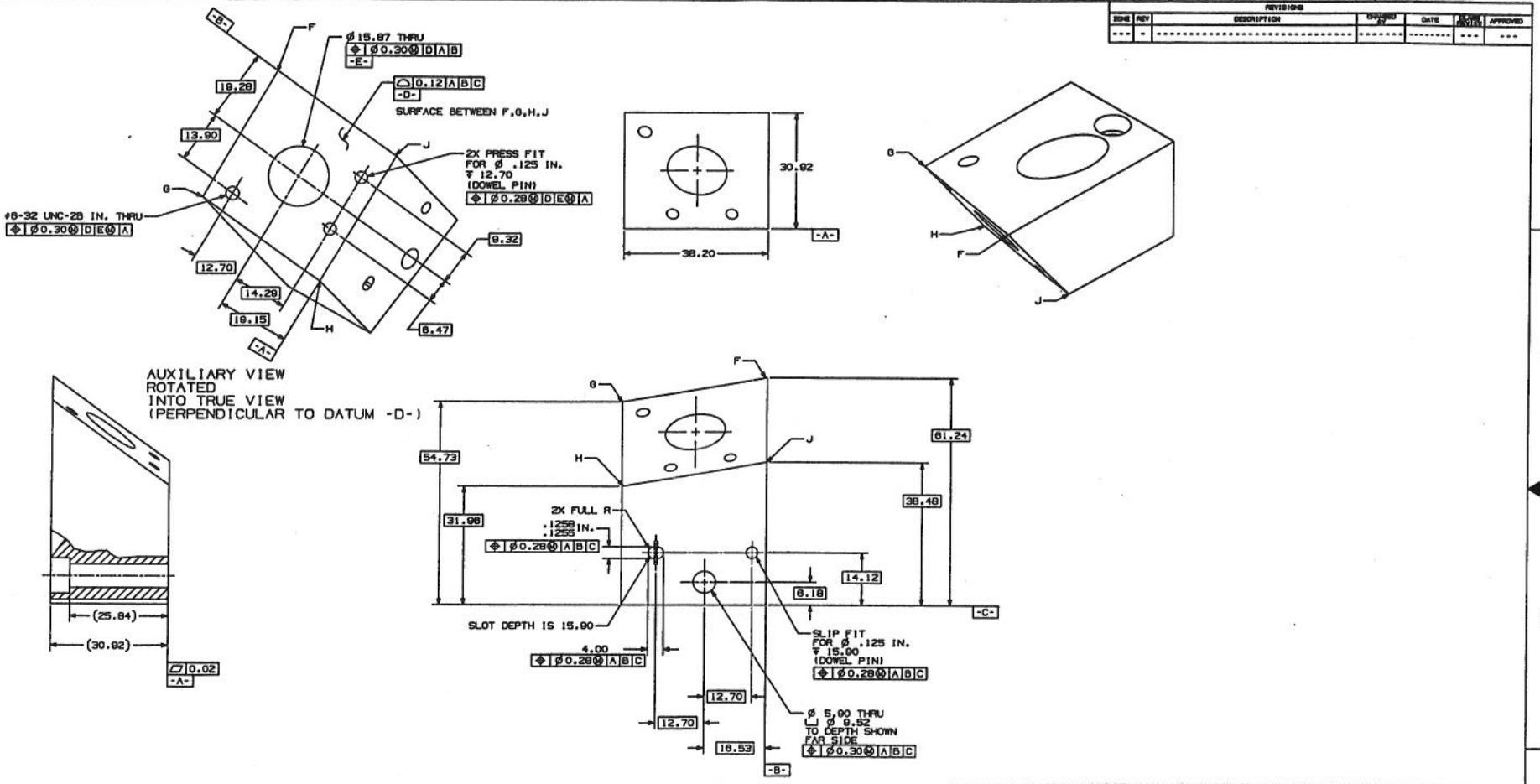
Los Alamos National Laboratory, Los Alamos, New Mexico 87545
ESA-DE DESIGN ENGINEERING

TITLE (UNC)
LENS HOLDER
MOUNTING BLOCK
F-C-T-L-2
R-C-T-L-2

DESIGNED	H.J. MATOUSEK		ESA-DE
DRAWN	N. ROMERO		ESA-DE
CHECKED	GARDNER		ESA-DE
ENGINEERING			
CUSTOMER			
RELEASED			

CAD SYSTEM & VER. UG11 /STL/PSRV
CLASSIFICATION
CLASS REVIEW NR
DRAWING UNC
PART: UNC
DATE

GROUP CODE 142Y | DWG No. 600638 | SIZE D | SHEET No. 2 | REV --
CAGE CODE 88516 | SCALE 2/1 | TOTAL SHEETS 3



NOTES:

1. DIMENSIONS & TOLERANCING PER ANSI Y14.5M-1982.
2. SURFACE TEXTURE PER ANSI/ASME B 46.1-1985.
3. REMOVE ALL BURRS AND BREAK SHARP EDGES TO A MAXIMUM OF 0.38
4. PARTS TO BE THOROUGHLY CLEANED TO REMOVE ALL OIL, GREASE, DIRT AND CHIPS.
5. ALL INSIDE CORNERS TO BE 0.38 RADIUS MAX.

W.S. JAN 0 8 2006

METRIC

BROOKHAVEN/PHENIX
DWG NO. 002-0212-238
DWG NO. 002-0212-338

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	ZONE	ITEM NO
16	--------	----------	ALUMINUM, 6061-T6		--

Los Alamos — Los Alamos National Laboratory, Los Alamos, New Mexico 87545
ESA-DE DESIGN ENGINEERING

TITLE (UNDI)
LENS HOLDER
MOUNTING BLOCK
F-C-T-R-2,
R-C-T-R-2

GROUP CODE	DWG No.	SIZE	SHEET No.	REV
142Y	600638	D	3	--

DATE 88516 | SCALE 2/1 | TOTAL SHEETS 3